



Hanford F Reactor Fuel Storage Basin Cleanout Accelerated Site Technology Deployment Project

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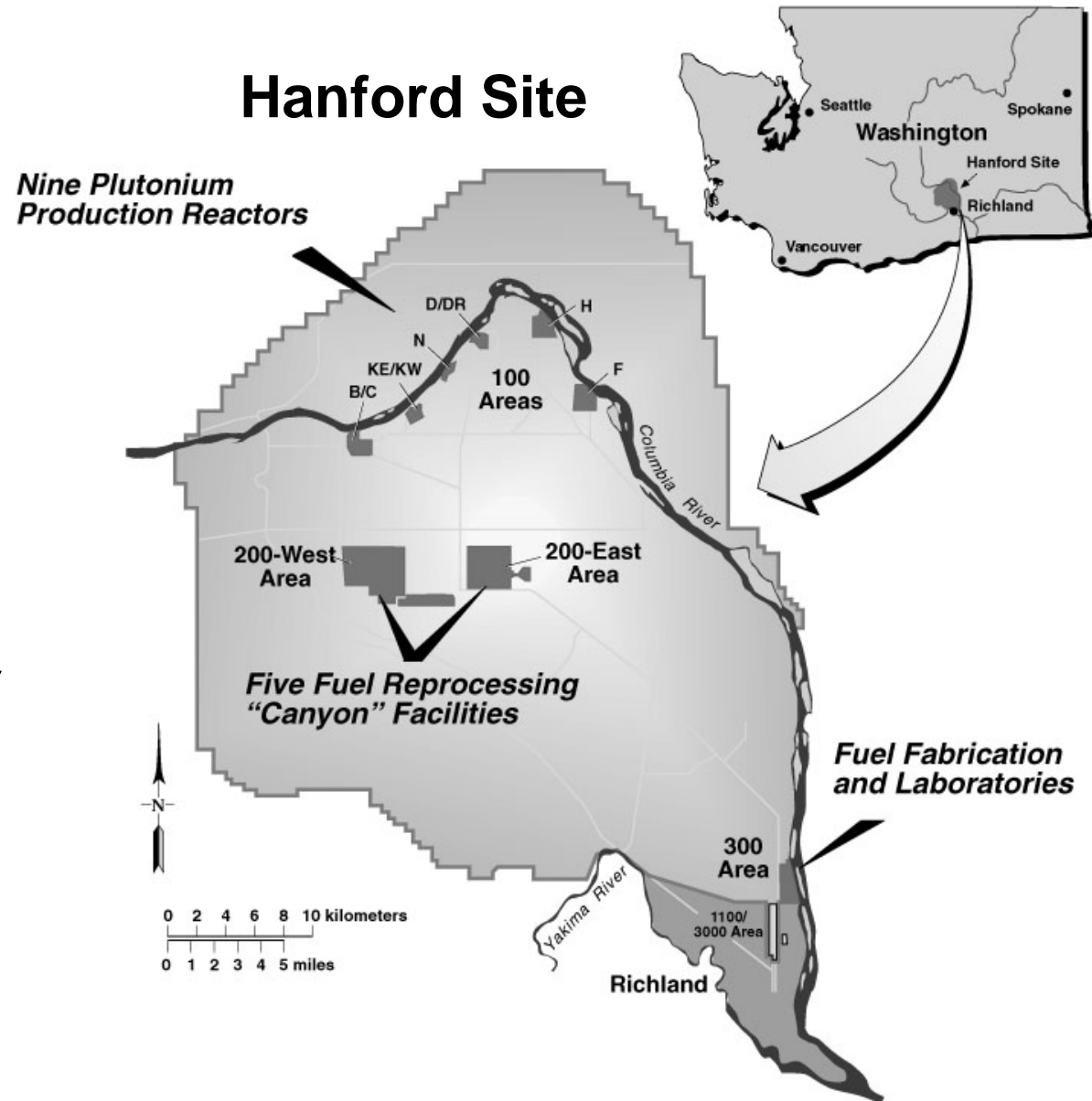
Bechtel Hanford, Inc.

March 2002

*Deactivation and Decommissioning Focus Area Midyear Review
Salt Lake City, Utah*

Relevancy

***50 Years
of Nuclear
Defense
Production***



Relevancy

Reactor ISS

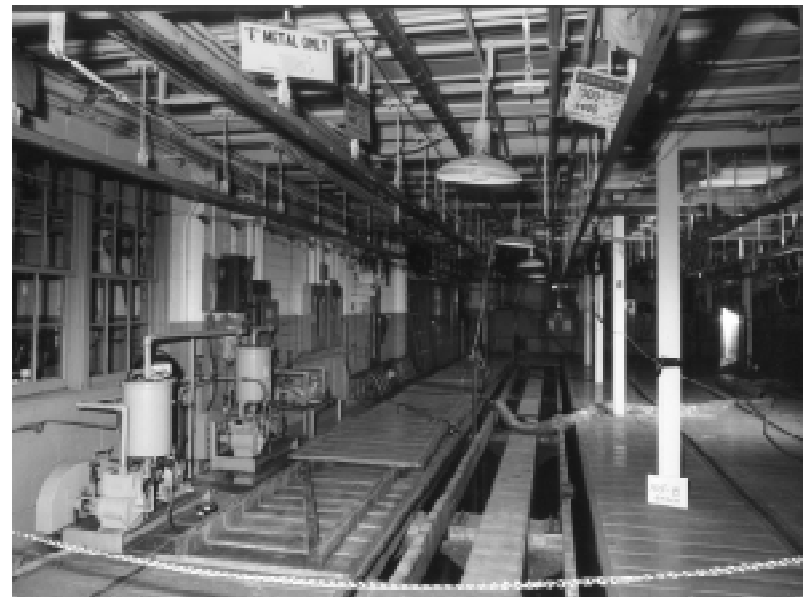
- Minimize releases to the environment
- Reduce potential risk to workers
- Reduce surveillance and maintenance costs
- Allow radioactive inventory to decay to safer levels
- Do not restrict future D&D options



Relevancy

FSB Cleanout

- Reinforced-concrete basin
- Miscellaneous items placed in bottom
- Backfilled with local surface material
- Potential for irradiated fuel elements
- Deploy technologies to improve on safety, cost and schedule



Technical Approach / Progress



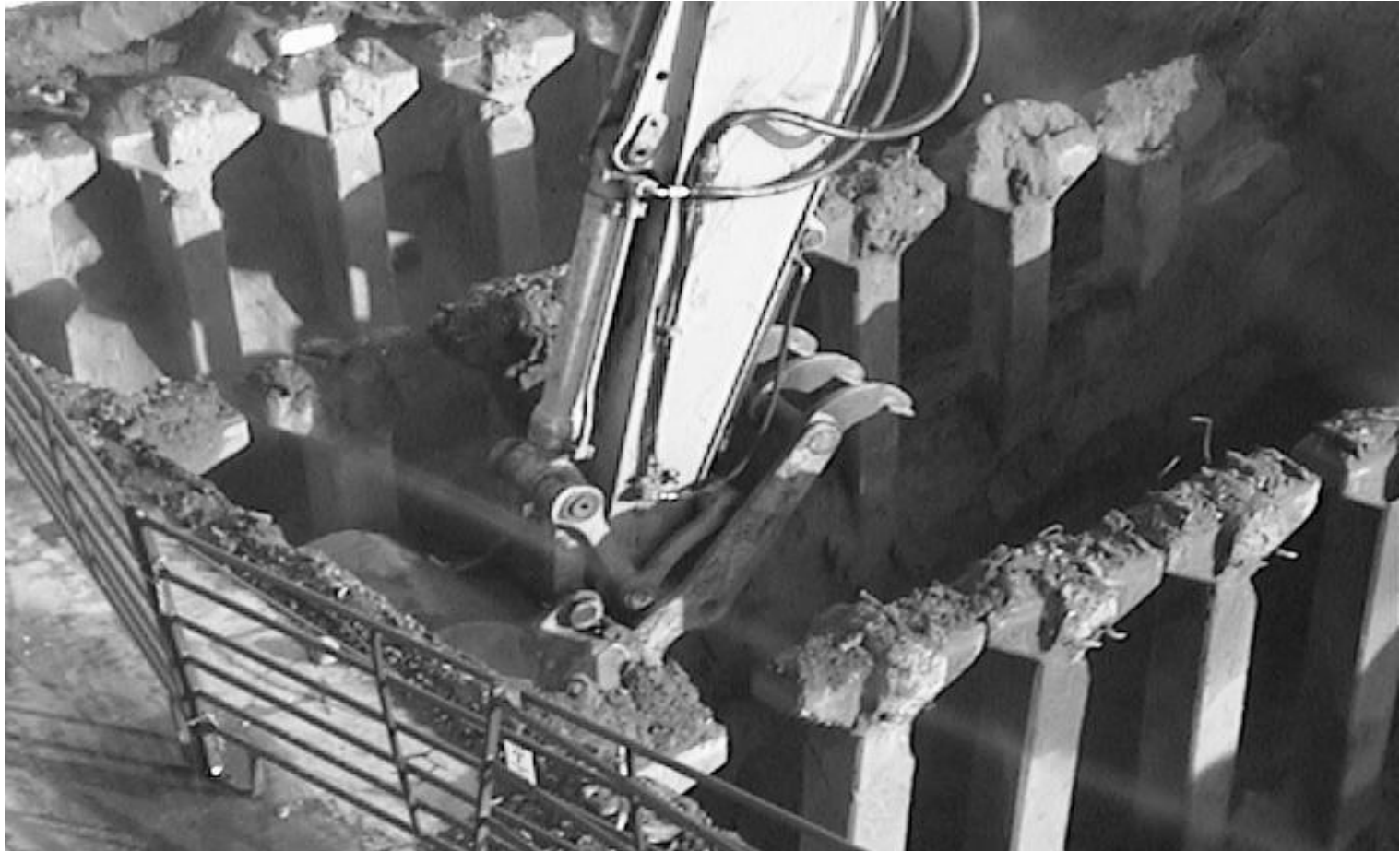
Demolition of above-grade structure

Technical Approach / Progress



Above-grade demolition complete

Technical Approach / Progress



Excavate backfill, concrete beams and columns

Technical Approach / Progress



Excavation to minus 17 feet complete

Technical Approach / Progress



GammaCam
and ISOCS

Remote characterization of remaining 30 inches

Technical Approach / Progress



LARADS

Remote characterization of remaining 30 inches

Technical Approach / Progress



Remote Retrieval System



Remote removal of soil and debris

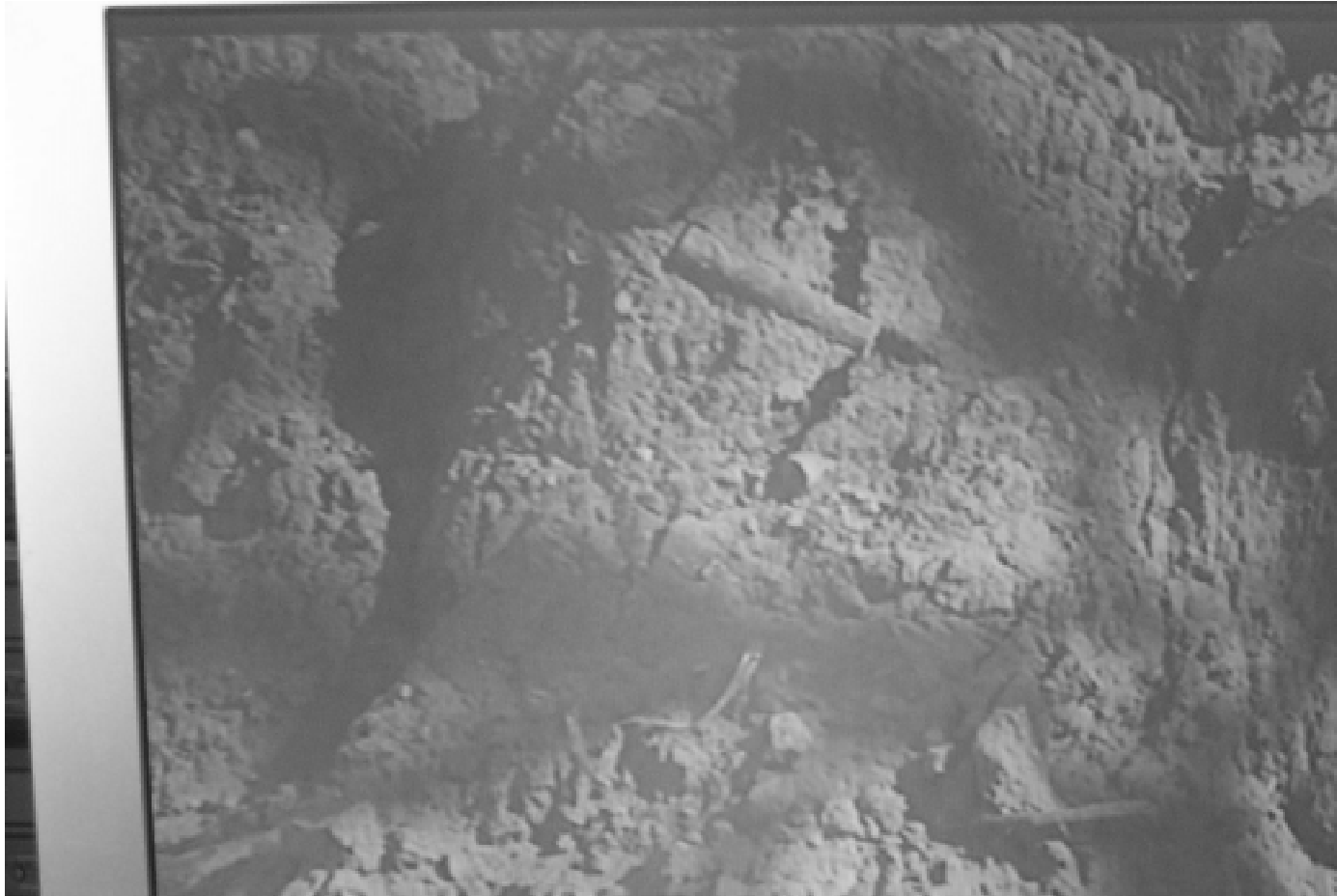
Technical Approach / Progress

Compact Remote
Console



Remote removal of soil and debris










Technical Approach / Progress



Fuel element in FSB










Benefits

GammaCam

Qualitative Benefit Analysis	
Programmatic Risk	 Use of the GammaCam positively contributed to meeting the characterization objectives of the project.
Technical Adequacy	 The GammaCam enabled the collection of more accurate data on the strength and location of radiation sources.
Safety	 The GammaCam greatly reduced contamination risks and other hazards to personnel by keeping them out of contaminated areas.
Schedule Impact	 The GammaCam improved the schedule by eliminating the wait for sample analyses turnaround.
<div> Major improvement</div> <div> Some improvement</div> <div> No change</div> <div> Somewhat worse</div> <div> Major decline</div>	
Quantitative Benefit Analysis	
Cost Impact Analysis	<p>Minimal cost savings were realized from this deployment. The primary benefits of this technology are qualitative, as described above.</p> <p>Estimated Life Cycle Cost Savings/Avoidance \$3.0K</p>










Benefits

ISOCS

Qualitative Benefit Analysis	
Programmatic Risk	 Use of the ISOCS positively contributed to meeting the characterization objectives of the project.
Technical Adequacy	 The source identification capability of ISOCS was a major improvement over baseline; however, it was difficult to maintain in a field environment.
Safety	 The remotely operated ISOCS significantly reduced the risk of contamination and other hazards to personnel.
Schedule Impact	 The real-time isotope identification capability of the ISOCS eliminated the wait for sample analyses turnaround.
<div> Major improvement</div> <div> Some improvement</div> <div> No change</div> <div> Somewhat worse</div> <div> Major decline</div>	
Quantitative Benefit Analysis	
Cost Impact Analysis	<p>Minimal cost savings were realized from this deployment. The primary benefits of this technology are qualitative, as described above.</p> <p>Estimated Life Cycle Cost Savings/Avoidance \$3.0K</p>

Benefits

LARADS

Qualitative Benefit Analysis	
Programmatic Risk	 Use of LARADS improved the project's ability to achieve its objectives within time and budget constraints.
Technical Adequacy	 LARADS improved the accuracy of the radiological survey.
Safety	 Use of the LARADS significantly reduced the risks to personnel from contact with contamination and other hazards.
Schedule Impact	 Use of LARADS consumed less time for planning, as personnel were not required to enter contaminated areas.
<div> Major improvement</div> <div> Some improvement</div> <div> No change</div> <div> Somewhat worse</div> <div> Major decline</div>	
Quantitative Benefit Analysis	
Cost Impact Analysis	<p>Minimal cost savings were realized from this deployment. The primary benefits of this technology are qualitative, as described above.</p> <p>Estimated Life Cycle Cost Savings/Avoidance \$1.2K</p>

Benefits

Remote Retrieval System

Qualitative Benefit Analysis	
Programmatic Risk	● Use of the Remote Retrieval System positively contributed to meeting the cleanup and characterization objectives of the project.
Technical Adequacy	◐ The Remote Retrieval System enabled the detailed and selective identification and retrieval of potentially highly radioactive materials.
Safety	● The Remote Retrieval System greatly reduced contamination risks and other hazards to personnel by keeping them out of contaminated areas.
Schedule Impact	◐ The Remote Retrieval System improved the schedule by reducing personnel required for baseline inspection, excavation and retrieval.
<div>● Major improvement ◐ Some improvement ○ No change ◑ Somewhat worse ● Major decline</div>	
Quantitative Benefit Analysis	
Cost Impact Analysis	<p>Significant cost savings were realized from this deployment. The primary cost savings are due to the reduction in personnel radiological exposure.</p> <p>Estimated Life Cycle Cost Savings/Avoidance \$6.1 million</p>

Benefits

Compact Remote Console

Qualitative Benefit Analysis	
Programmatic Risk	<input type="radio"/> Use of the Compact Remote Console does not significantly impact this area.
Technical Adequacy	<input type="radio"/> Use of the Compact Remote Console does not significantly impact this area.
Safety	<input checked="" type="radio"/> The Compact Remote Console improves safety by providing the operator an ergonomically workstation that also decreases worker fatigue.
Schedule Impact	<input checked="" type="radio"/> The Compact Remote Console contributes to improved schedule as reduced worker fatigue results in improved efficiency.
<div><div><input checked="" type="radio"/></div>Major improvement</div> <div><div><input checked="" type="radio"/></div>Some improvement</div> <div><div><input type="radio"/></div>No change</div> <div><div><input checked="" type="radio"/></div>Somewhat worse</div> <div><div><input checked="" type="radio"/></div>Major decline</div>	
Quantitative Benefit Analysis	
Cost Impact Analysis	No direct cost savings resulted from this deployment. The benefits of this technology are qualitative as described above.

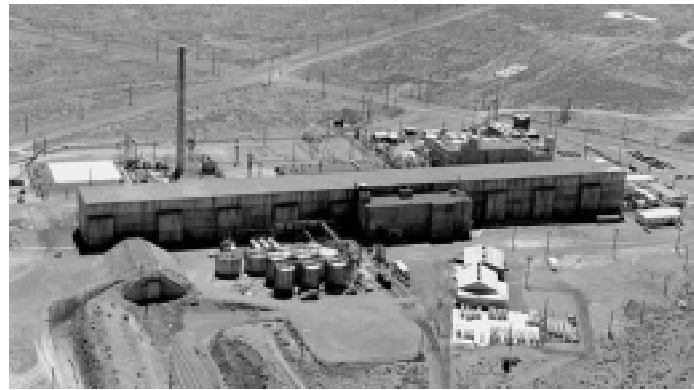
ASTD Project Summary

- **Five (5) technologies deployed**
- **Technologies achieved project objectives while minimizing risk to workers**
- **Estimated cost savings of greater than \$6M and a two-year acceleration of the project schedule**

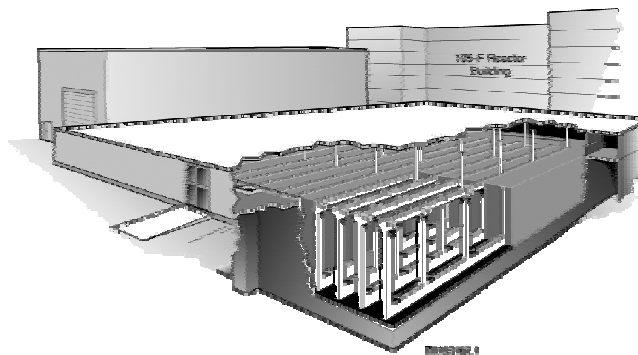
Partnerships between the Hanford Environmental Restoration Project and the Deactivation and Decommissioning Focus Area



**C Reactor Interim Safe Storage
Large-Scale Demonstration and
Deployment Project**

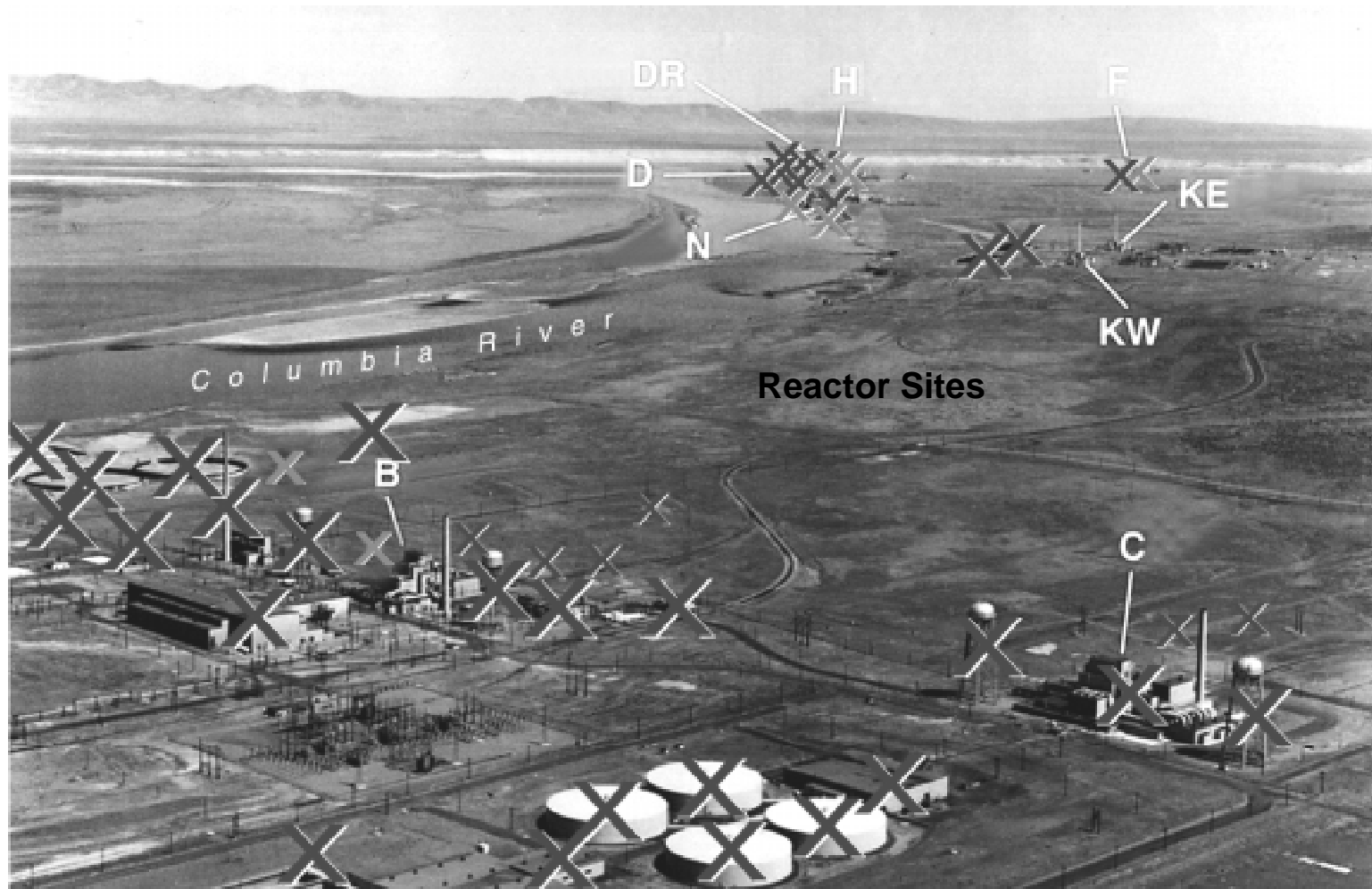


**Canyon
Disposition
Initiative
Project**



**F Reactor Fuel Storage Basin
Cleanout Accelerated Site
Technology Deployment Project**

D&D Projects Progress at Hanford



Conclusions

- **Technologies have been integral in meeting decommissioning project objectives at the Hanford Site**
- **Partnership with EM-50 has provided the means to maximize the use of improved technologies**
- **More than 40 technology deployments**
- **Reduced risks to workers**
- **Greater than \$31M in life-cycle cost savings**
- **Significant schedule improvement over baseline**
- **For additional information see www.bhi-erc.com**